PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey Of Shoal Lake (#2)

A. R. McLean
1991

PWFWCP Report No. 109

105-02939/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: A. R. McLean. 1991. A reconnaissance survey of Shoal Lake (#2). Peace/Williston Fish and Wildlife Compensation Program, Report No. 109. 21pp plus appendices.

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A RECONNAISSANCE SURVEY OF

SHOAL LAKE (#2)

WATERSHED: Parsnip River

DATE OF SURVEY: June 18. 19. 1991

FIELD CREW LEADER: A.R. McLean

FIELD ASSISTANT: A.R. Langston

WILLISTON/PEACE FISHERIES
COMPENSATION PROGRAM

B. C. HYDRO

ENVIRONMENTAL RESOURCES

and

B.C. ENVIRONMENT

RECREATIONAL FISHERIES BRANCH

REPORT PREPARED BY: A.R. McLean

REPORT EDITED BY: A.R. Langston/B.G. Blackman

RELEASED BY: _____

D.H.G. Ableson, Regional Fisheries Biologist

LAKE: **Shoal #2**

SYSTEM NAME: Unnamed C.

A.S.A.P. REFERENCE NO.:

SYSTEM NO: 230-9183

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved O2/Temp. Profiles	X
Physical Data	X	Winter Dissolved O2/Temp. Profiles	X
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	--
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	--
Obstructions and Pollutions	X	Scale Reading	--
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices:	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	--
Fisheries Management Comments	X	Bathymetric Map Reduction	X
History of Previous Surveys	X	Bathymetric Map	X
Water Chemistry Summary	X		

LOCATION

Location: 85 km. northwest of Mackenzie
Elevation: 750 m +/-
Latitude/Longitude: $55^0 49'15":124^0 04'43"$ U.T.M.: 10.4323.61864
Management Unit: 7-29 N.T.S, Map No.: 93-N/16

Drainage: Unnamed C. --> Shoal Lake #1 --> Unnamed C. --> Williston Reservoir (Parsnip Reach) --> Peace River

PHYSICAL DATA

Lake Drainage Area:	--	km^2	Volume:	839000	m^3
Water Surface Area:	325000	m^2	Flushing Rate:	--	
Area above 6 m contour:	315000	m^2	Perimeter of Islands:	--	m
Shoreline Perimeter:	3340	m	Number of Islands:	0	
Maximum Depth:	6.3	m	Mean Depth:	2.6	m
Filterable Residue (TDS):	112	mg/l	Secchi Reading:	3.5	m

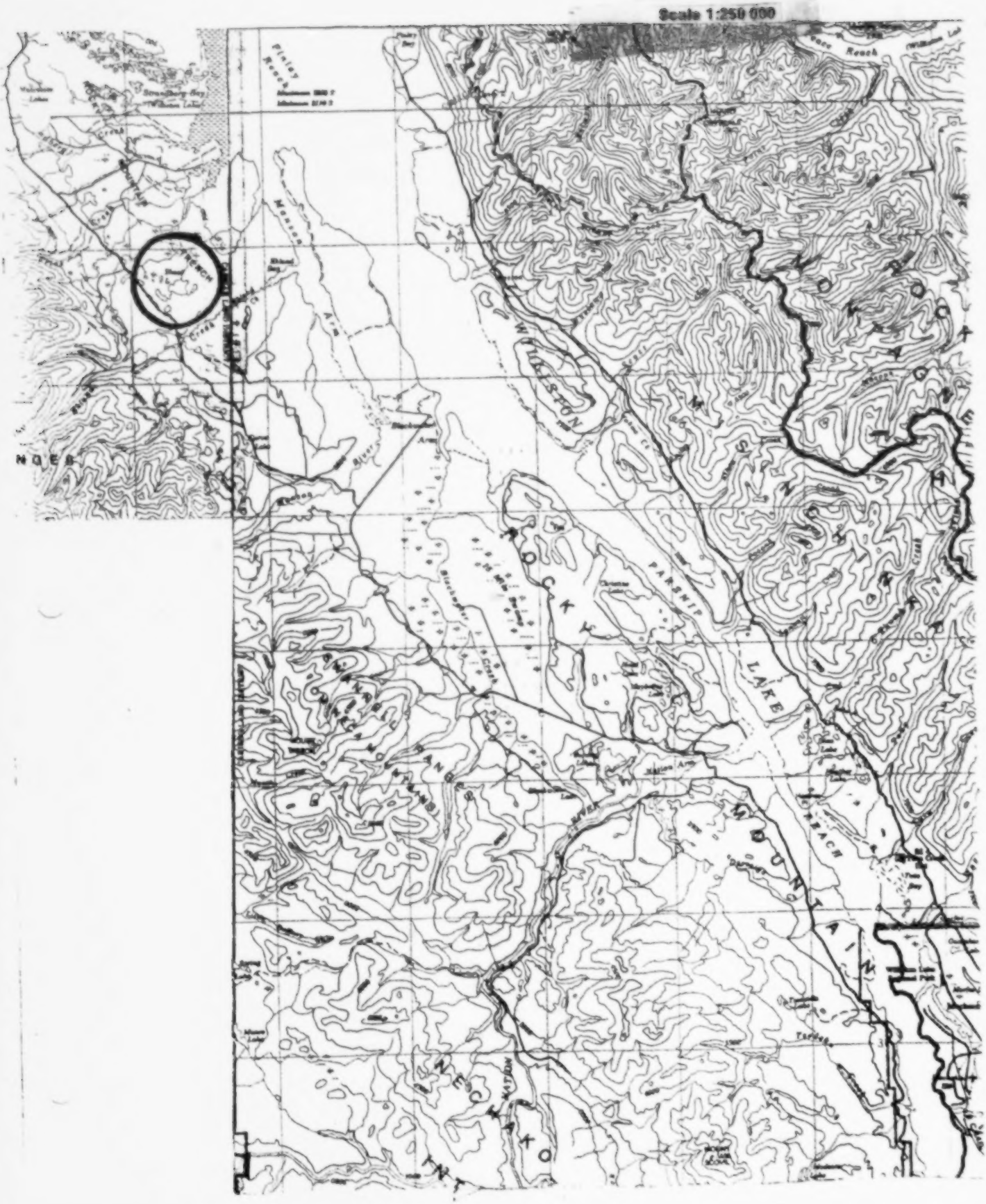
Sounding Device: Lowrance X-15

Elevation Source: Contour interpolation

BENCHMARK

(Iron spike, center of red circle) located at the southwest shore (2.0 m west of old access road), 3.5 m from waters edge, in a 20.0 cm diameter Lodgepole pine tree.

High water mark: Lake appears to be at maximum pondage.


Scale 1:250 000
ROCKY
PARSNIP
LAKE
MOUNTAIN
RANGE
WILLISTON
NECHAKO
PLATEAU

Shoal Lakes

Lake: **SHOAL #2**

TERRAIN FEATURES

Immediate Shoreline:

Shoreline slope to water's edge is generally low, but moderate on the north shore. Shoal Lake #2 is treed to lake's edge (lodgepole pine, spruce, some small alder), with the exception of the north and south ends, which are floating sedgegrass mats with stunted spruce and alder. A 2.0 m fringe of sedgegrass fronts the entire shoreline. Access to the lake is limited to a rough skidder trail located on the west shore. Access from lake to shore is fair, with marsh and sedgegrass restricting shoreline access. Shoreline substrate is predominantly organics, with some fines and cobble noted. Lake bottom drops off slowly, with the exception of the moderately sloped north shore.

Surrounding Country:

The dense mature forest cover is predominated by Lodgepole pine, with secondary stands of spruce and birch intermixed throughout. The lake is surrounded by tow rolling hills. Snow capped peaks are visible to the southwest.
Shoal Lake #2 is located within a Recreation Reserve in the sub-boreal spruce biogeoclimatic zone.

Lake: **SHOAL #2**

ACCESS

Directions:

From the junction of Mackenie Boulevard (Highway 39) and Centennial Drive in downtown Mackenzie, drive south on Highway 39 for 30 km. Turn right on to Highway 97 (this is the junction of Highway 39 and Highway 97) and travel 3.1 km south to the junction of Finlay Forest Service Road and turn right again. Proceed 125.8 km on the Finlay Forest Service Road (crossing over Nation and Manson Rivers) and turn right down an old skidder trail. Travel 0.55 km to lake's edge. Total distance to Shoal Lake #2 is 159.5 km by vehicle from Mackenzie.

Road Type and Conditions:

Highways 39 and 97 are both paved and in good alt-weather condition. Finlay Forest Service Road is a two wheel all-weather gravel, main haul, logging road in fair to good condition. Some low-lying areas are soft and badly rutted. The overgrown skidder trail access is in very poor condition, making 4x4 travel difficult, but possible, only during dry weather.

Restrictions:

None noted.

RESORTS AND CAMPSITES

A rough campsite exists at the foot of the skidder trail. Discussions are in progress with Mackenzie Forest District with regards to access improvement and recreation site development, if this lake is stocked.

OTHER DEVELOPMENTS

None.

Late: **SHOAL #2**

OBSTRUCTIONS AND POLLUTIONS

A beaver dam located at the lake outlet may be an obstruction to fish passage. Nine more dams are located on the 0.75 km outlet, of which, one or more appear to be barriers to fish passage.

SPECIAL RESTRICTIONS

None noted.

AQUATIC PLANTS

All aquatic plants were sparse along the lake shore, with the exception of sedgegrass, which was moderately abundant.

The following aquatic plants were observed in the field, none were collected:

Potamogeton sp. sedgegrass

Nuphar sp. Polygonum sp.

Ceratophyllum SP. Equisetum SP.

WILDLIFE OBSERVATIONS

1 lesser scaulp 2 ravens

1 loon 1 bald eagle

1 red-winged blackbird

moose signs abundant (beds, scat, trails)

beaver activity noted.

MISCELLANEOUS COMMENTS

Juvenile cyprinids were observed throughout the lake outlet.

Bathymetric map: The lake outline is from an enlargement of aerial photograph BC 7354 No. 141, flown June, 1970.

Lake: **SHOAL #2**

LAKE DRAINAGE

General:

Shoal Lake #2 has no inlets and one outlet. The outlet flows approximately 0.75 km northeast to Shoal Lake #1. Drainage continues from Shoal Lake #1, northeast 8.0 km to its confluence with Williston Reservoir (Parsnip Reach).

Major Systems:

None.

Minor Systems:

Unnamed C. - outlet

A beaver dam (approximately 40.0 m length by 0.6 m in height) is located at the outlet. This dam controls the current lake level. A second dam (25.0 m in length by 0.5 m in height) is situated 25.0 m downstream of the lake. A total of 10 more beaver dams are located in the outlet. This meandering undefined creek has a complete organic substrate, subsequently no spawning habitat is available.

Lake: **SHOAL #2**

FISHERIES MANAGEMENT COMMENTS

Two overnight net sets produced a large population of coarse fish (longnose and coarse suckers, redside shiners) but no sportfish species. No salmonid spawning habitat was observed, and creation of such would be difficult due to high beaver activity.

Any salmonid stocking program would result in a chronic spawnbound situation. Oxygen/temperature series taken during the winter of 1990/91 appeared questionable for overwintering fish. Shoal Lakes #1 and #3 are tentatively scheduled for future inventories. Should the potential exist for a remote, three lake recreation area in the future, stocking of Shoal Lake #2 could be considered.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

An oxygen/temperature series was collected on March 19, 1991, by A.R. McLean, Williston/Peace Fisheries Compensation Program, Prince George.

Other Belated Surveys:

None known.

Lake: **SHOAL #2**

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	June 19, 1991		
Time:	1320 hrs	Air Temperature:	23.0 °C
Wind Velocity:	5.0 km/hr	Wind Direction:	west
Cloud Cover:	1/10 o.c.	Surface Condition:	v. light ripple
Secchi Disc:	3.5 m	Water Colour:	olive green/drab

Method(s) Used:

Dissolved Oxygen:	YSI model 58 oxygen/temperature meter
Water Temperature:	YSI model 58 oxygen/temperature meter
Air Temperature:	Hand-held alcohol thermometer
Ph (field):	Hach pH field test kit.
H2S (field):	Hach H2S field test kit
Laboratory Used:	Zenon Environmental Inc. B.C. Laboratory Services
Water Sampler:	Verticle Alpha Water Bottle (Vandorn)
Substrate Sampler:	Substrate sample not taken

Water Sample Chemistry: SEAM Site No.: Not determined

	Sampling Depths			
	Surface (0 m)		Lower (5.5 m)	
pH (field)	8.5		7.8	
pH (lab)	8.1		7.8	
Specific Conductance (lab)	163	umhos/cm	178	umhos/cm
Filterable Residue 105°C (lab)	112	mg/l	120	mg/l
H2S (field)	--	mg/l	0	mg/l
Bottom Depth:	6.3	m		
Substrate Sample Depth:	--	m		

No H2S odour detected.

NOTE: Water samples too long in transit to guarantee accuracy of lab pH results.

Lake: **SHOAL #2**

DATE: June 19, 1991

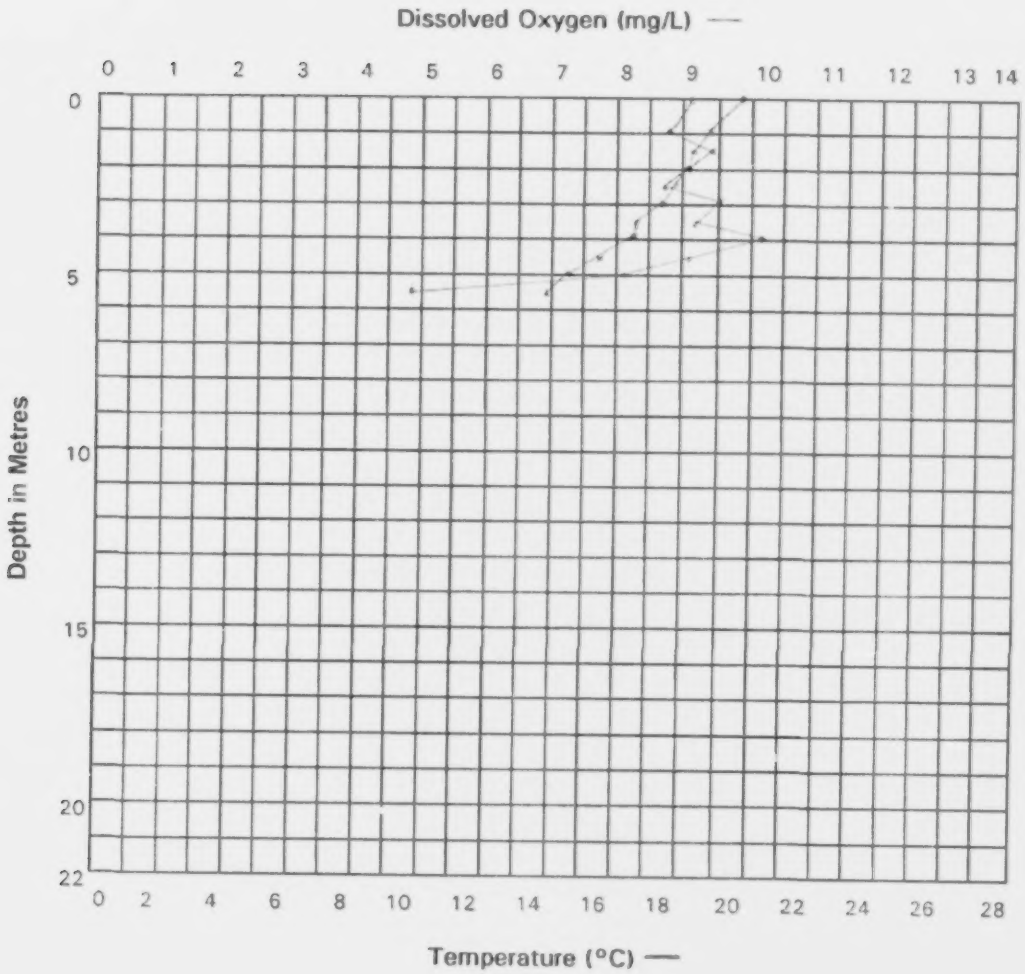
SUMMER OXYGEN/TEMPERATURE DATA

DEPTH (m)	02 (mg/l)	TEMP (^{0}C)
Surface	9.1	19.8
1.0	8.8	18.9
1,5	9.4	18.3
2.0	9.2	18.2
2.5	3.8	17.9
3.0	9.5	17.4
3.5	9.2	16.6
4.0	10.2	16.6
4.5	9.2	15.5
5.0	8.1	14.5
5.5	4.9	13.9
6.3	Bottom	

Lake: **SHOAL #2**

SUMMER

DISSOLVED OXYGEN AND TEMPERATURE SERIES



Lake: **SHOAL #2**

DATE: March 19, 1991
Time: 1230 hrs
Air temp.: 7 °C
Wind: nil

CREW: A.R. McLean
Snow depth: 6 cm
Ice Depth: 63 cm
Weather: overcast

WINTER OXYGEN/TEMPERATURE DATA

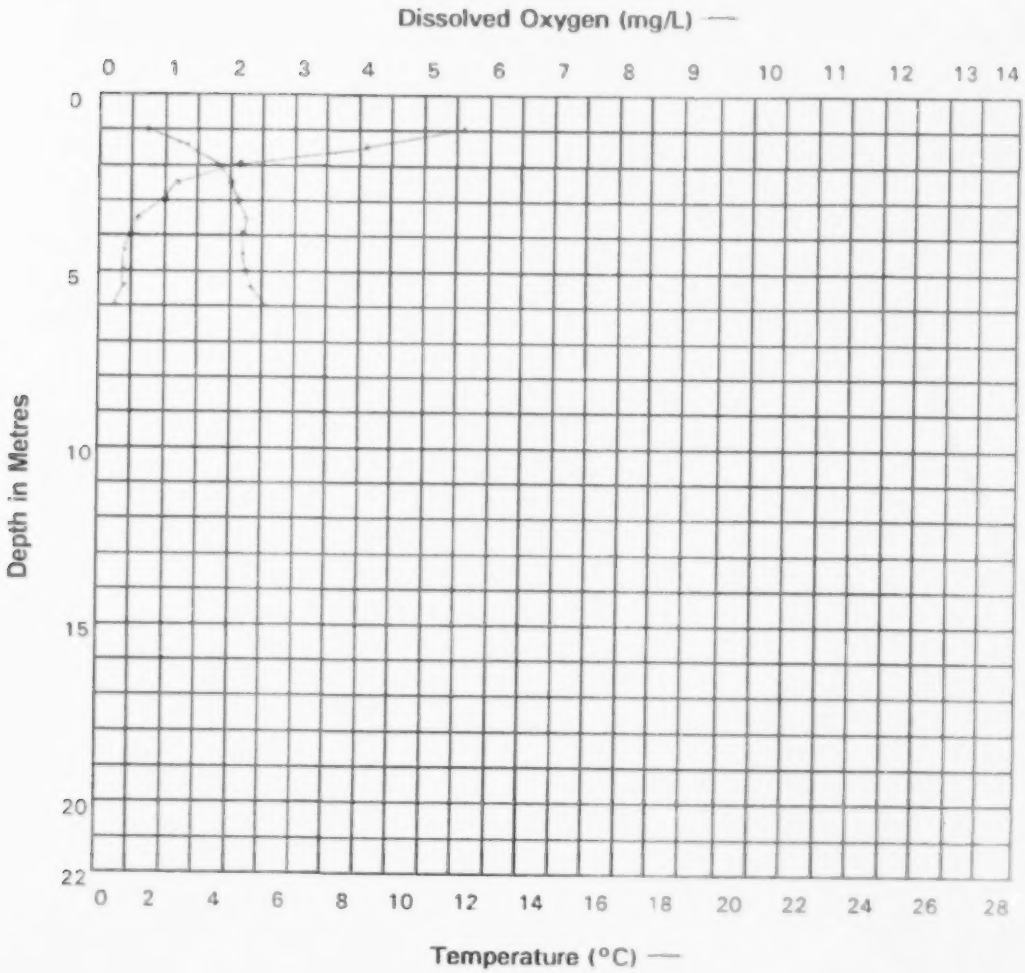
DEPTH (m)	02 (mg/l)	TEMP (°C)
Surface *		
1.0	5.6	1.6
1.5	4.1	2.7
2.0	2.2	3.6
2.5	1.2	4.0
3.0	1.0	4.2
3.5	0.6	4.4
4.0	0.5	4.4
4.5	0.4	4.4
5.0	0.4	4.5
5.5	0.4	4.8
6.0	0.3	5.1
6.6	Bottom	

* Surface is referenced from top of ice, i.e. surface = top of ice.

Lake: **SHOAL** #2

WINTER

DISSOLVED OXYGEN AND TEMPERATURE SERIES



Lake: **SHOAL #2**

NETTING RECORD

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 18, 1991	Time:	1000 hrs
Date Lifted:	June 19, 1991	Time:	1000 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.0 m
		Substrate:	organics covering boulder/cobble
Deep End Mesh Size:	64 mm	Depth:	5.5 m
		Substrate:	organics

NETTING SITE #2

Type:	Sinking monofilament		
Date Set:	June 18, 1991	Time:	1040 hrs
Date Lifted:	June 19, 1991	Time:	1140 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.0 m
		Substrate:	organics/cobble
Deep End Mesh Size:	64 mm	Depth:	4.5 m
		Substrate:	organics

Lake: **SHOAL #2**

LAKE CATCH SUMMARY

SPECIES	NET SITE NO.				ANGLED	OTHER	TOTAL	NUMBER SAMPLED	NUMBER PRESERVED	SIZE RANGE (cm)
	1	2	3	4						
longnose sucker	227	108			--	--	335	--	--	10.7 - 21.0
course sucker	27	67			--	--	94	--	--	12.0 - 35.5
redside shiner	1				--	--	1	--	--	

Comments:

Blackspot disease visible on some longnose suckers.

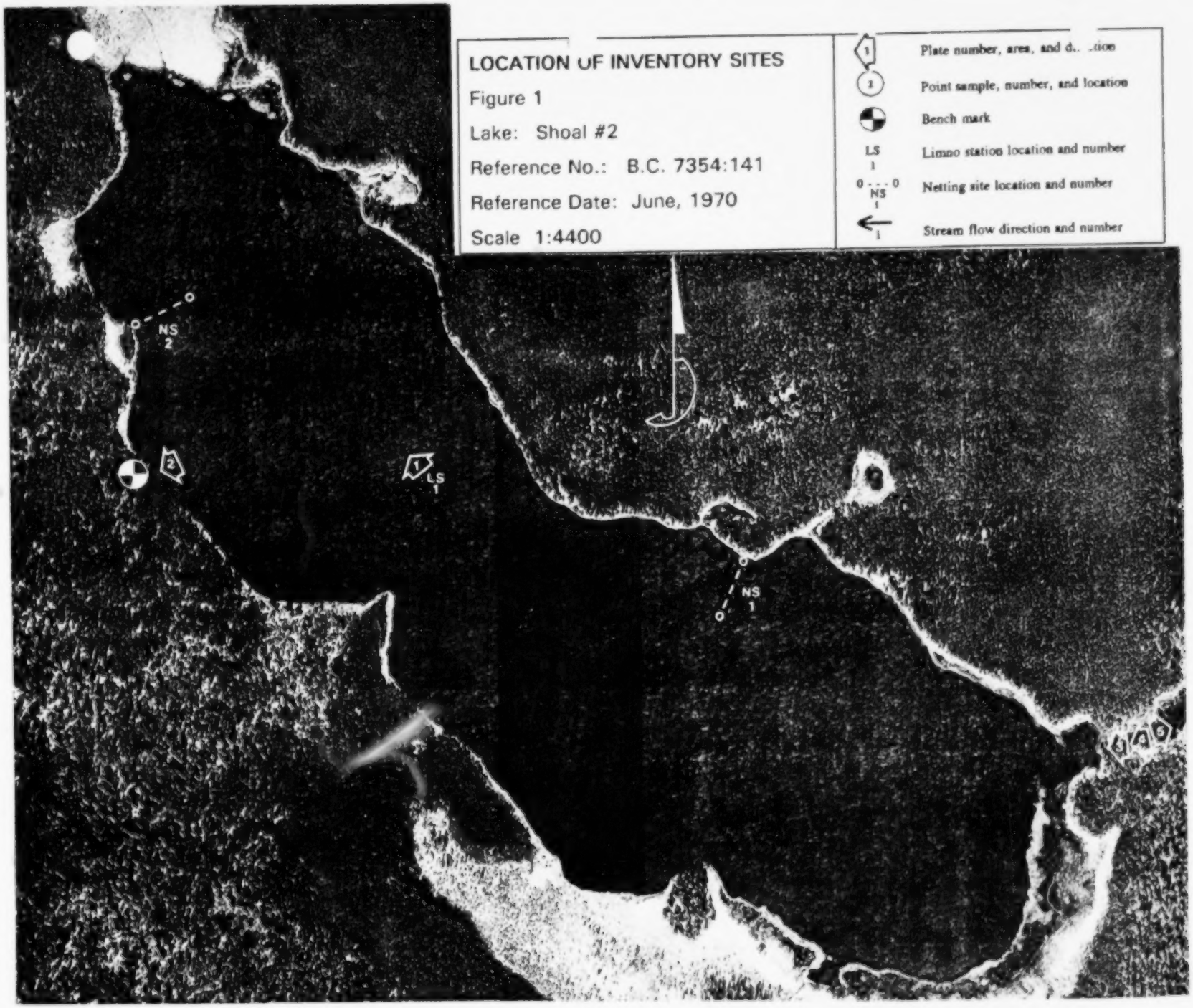
Minnow Traps:

BAIT: Sardines

*	HOURS	DEPTH (m)	SUBSTRATE	SPECIES	SIZE RANGE (cm)
1 *	2.95	0.8	organics	214 - redside shiners 13 - longnose suckers 13 - leeches	4.0 - 8.1 6.0 - 13.5
2 *	3.95	0.7	organics/cobble	367 - redside shiners 5 - longnose suckers	4.5 - 8.7 7.3 - 11.9
3	20.9	1.0	organics/fines/ cobble	249 - redside shiners 8 - longnose suckers 5 - coarse scale suckers	5.1 - 7.4 5.5 - 9.8 7.0 - 12.8

Comments:

* Pulled minnow traps with short soak times as noted traps plugged with fish


LOCATION OF INVENTORY SITES
Figure 1
Lake: Shoal #2
Reference No.: B.C. 7354:141
Reference Date: June, 1970
Scale 1:4400
Plate number, area, and d.. ..tion
Point sample, number, and location
Bench mark
LS 1
Limno station location and number
NS 1
Netting site location and number
Stream flow direction and number
NS 2
LS 1
NS 1

Lake: **SHOAL #2**

PHOTOGRAPH DIRECTORY

Negative #	Plate #	Description
R5:14,15	1	Panoramic view looking northwest, taken from limno station. Snow capped peaks visible in background. Our camp is located to the left.
R5:19	2	Present access to the west shore of the lake via rough skidder trail. Note bench mark location to the right.
R5:13	3	View looking upstream at beaver dam (approx. 40.0 m in length, 0.6 m in height) on outlet. This dam controls current lake level. Note Shoal Lake #2 in background.
R5:12	4	View looking upstream at beaver dam #2 and it's pond, located 25.0 m downstream of the lake.
R5:11	5	View looking downstream at pond created by beaver dam #3. Taken from beaver dam #2.

Lake: SHOAL #2

Plate 1: Panoramic view looking northwest, taken from limno station. Snow capped peaks visible in background. Our camp is located to the left.

Lake: **SHOAL #2**

Plate 2: Present access to the west shore of the lake via rough skidder trail. Note bench mark location to the right.

Plate 3: View looking upstream at beaver dam (approx. 40.0 m in length, 0.6 m in height) on outlet. This dam controls current lake level. Note Shoal Lake #2 in background.

Lake: **SHOAL #2**

Plate 4:

View looking upstream at beaver dam #2 and it's pond, located 25.0 m downstream of the lake.

Plate 5: View looking downstream at pond created by beaver dam #3. Taken from beaver dam #2.

Lake: **SHOAL** #2

Appendix A

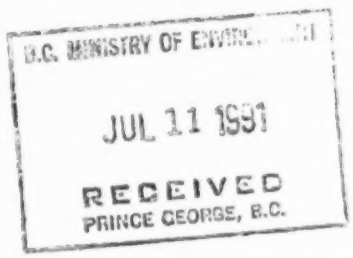
LABORATORY REPORT

Water Chemistry Analysis

Site: NOSITE SHOAL LK NO 2

Submitted by (00000) MCLEAN A

Address (07) Waste Management Branch
Northern Region
3rd Floor, 1011 4th Avenue
Prince George, BC V2L 3H9



Phone No. 565-6944

Audit Sample ( )
Client study reference code ( )
Sampling agency code (91)

Site (NOSITE) SHOAL LK NO 2

Sample Adjective ( )
Sample State (FW) Fresh Water
Sample Descriptor ( ) Undefined

This form was processed to the computer on 25-JUN-1991 as REGULAR
The cost for analyzing samples for this form is

Routine analysis:	$	116.84
Special analysis:	$	0.00
Total	$	116.84

Site: NOSITE SHOAL LK NO 2

From :91/06/19:0001 To :91/06/19:0001
Depth Range : 0.0 0.0 Tide :
Sample State: Fresh Water
Sample Comment:

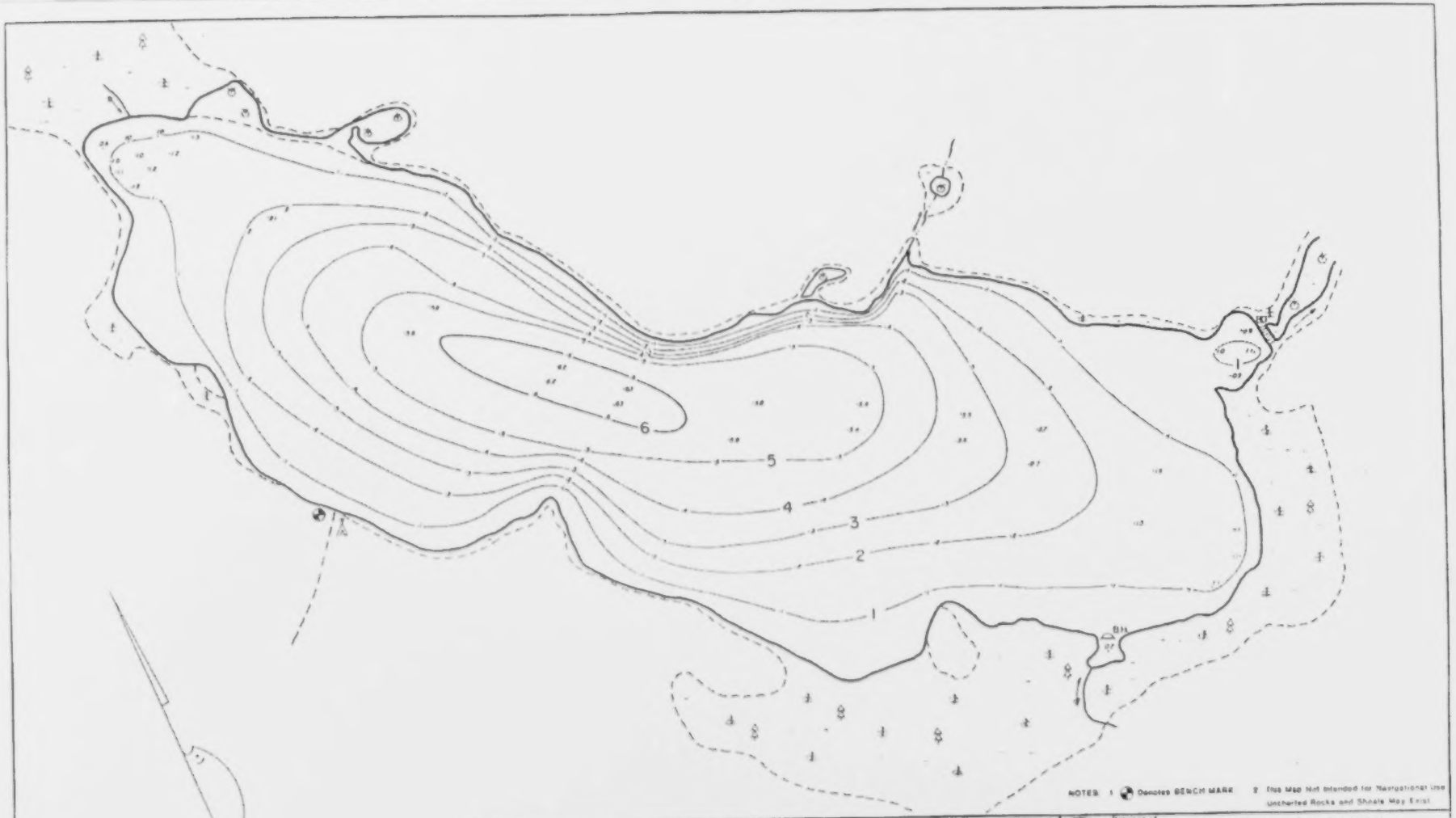
Parameter Description	Result	Units	Analytical Technique (Sparcode/Medium/Pres'n)
pH	?	pH units	Automated pH Meter (00041220/02/01)
Result 8.1, pH units. Analyzed outside of optimal time frame.			
Residue Nonfilt.	2	mg/L	Grav; 9 cm Buchner, 105C (00081070/02/01)
Specific Conductance	163	uS/cm	Cond. Meter Siebold (00111160/02/01)
Res. Filterable 1.0u	112	mg/L	Gravimetric 1.0u Filter (007H1032/02/01)
Alkalinity Total 4.5	?	mg/L	Automated Electrometer (01021210/02/01)
sult 85.7, mg/L. Analyzed outside of optimal time frame.			

DISTRIBUTION	DATE	INITIALS

Site: NOSITE SHOAL LK NO 2

From :91/06/19:0002 To :91/06/19:0002
Depth Range : 5.5 5.5 Tide :
Sample State: Fresh Water
Sample Comment:

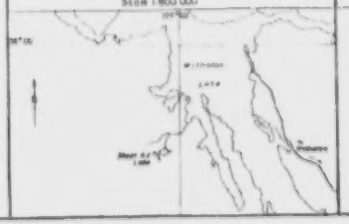
Parameter Description	Result	Units	Analytical Technique (Sparcode/Medium/Pres'n)
pH	?	pH units	Automated pH Meter (00041220/02/01)
Result 7.8, pH units. Analyzed outside of optimal time frame.			
Residue Nonfilt.	5	mg/L	Grav; 9 cm Buchner, 105C (00081070/02/01)
Specific Conductance	178	uS/cm	Cond.Meter Siebold (00111160/02/01)
Res. Filterable 1.0u	120	mg/L	Gravimetric 1.0u Filter (007H1032/02/01)
Alkalinity Total 4.5	?	mg/L	Automated Electrometer (01021210/02/01)
sult 93.6, mg/L. Analyzed outside of optimal time frame.			



NOTES: 1 Denotes BENCH MARK 2 This Map Not Intended for Navigational Use Uncharted Rocks and Shoals May Exist

Reduced to
50%
of Original

INSET MAP
Scale 1:600 000



SURVEYED BY: A.R. McLEAN DATE: JUNE 18, 1971
OUTLINE SOURCE: AIRPHOTO BC 7254 (JUNE 1970)

STATISTICS AT TIME OF SURVEY

ELEVATION	750 m.ā
SURFACE AREA	325 000 sq. m.
AREA ABOVE 6m. CONTOUR	315 000 sq. m.
VOLUME	839 000 cu. m.
MEAN DEPTH	2.6 m.
MAX. DEPTH	6.3 m.
PERIMETER, MAIN SHORE	3 340 m.
PERIMETER, ISLANDS	m.
BENCH MARK HEIGHT ABOVE WATER LEVEL	2.0 m.

Province of British Columbia
Ministry of Environment

FISHERIES BRANCH
INVENTORY OPERATIONS

SHOAL LAKES (#2*)

DEPTHS IN METERS

WATERSHED CODE 230-5183		U.T.M. CO-ORDINATE 10 437750 6468500
MAP 7-E9	FAIR DWG R.A.D.	REV. DATE
PLOTTING R.S.D.	FAIR DWG CHECK D.M.C.	SCALE 1:2500
CONTOURS J.A.B.	DRAFT DATE FEB 17, 1972	
CALCULATIONS D.M.C.	APPROVED	NTS NO. 93N/16
TECH. CHECK D.M.C.		